

# ***ANACAPA ISLAND RESTORATION PROJECT***

## ***CHAPTER ONE PURPOSE AND NEED***

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## Introduction

Channel Islands National Park has prepared this Final Environmental Impact Statement to document environmental impacts that would be associated with eradication, prevention, and emergency response management actions associated with non-native rat (*Rattus*) species. Specifically, this FEIS will cover proposed management actions in the following three areas: 1) Eradication of the Black Rat (*Rattus rattus*) on Anacapa Island; 2) An emergency response plan for dealing with accidental introductions of rats on Anacapa, Santa Barbara, Prince, and Sutil Islands; and 3) A prevention strategy to reduce the potential for rats to be accidentally introduced to Park islands. This FEIS includes analysis of effects for six alternatives, including the consequences of not eradicating the Black Rats from the Island, or not reacting to or preventing rat introductions to Park islands.

This Final EIS is based on direction contained in the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations 40 CFR 1500-1508, and the National Park Service NEPA implementation guideline (NPS-12).

The Final EIS will also document the Park's obligation to meet other federal laws including: The National Historic Preservation Act; Federal Water Pollution Control Act (Clean Water Act); Clean Air Act; Coastal Zone Management Act; Marine Mammal Protection Act; and the Endangered Species Act.

CEQ regulations require a Notice of Availability (NOA) be made to the Federal Register that a final EIS has been completed. The Park will wait at least 30 days from the Federal Registers publishing of the NOA before signing a record of decision.

Channel Islands National Park General Management Plan (GMP) provides direction for management of the Park. Decisions and direction identified in these documents are incorporated by reference. This EIS is "tiered" to the GMP as permitted by 40 CFR 1502.2.

## General Management Plan Direction

The General Management Plan (GMP) completed in 1985 defines management direction for the natural resources within the Park. In this GMP specific objectives are stated for Anacapa, San Miguel, and Santa Barbara Islands. Objectives from the GMP which support the Anacapa Island Restoration Project include:

- Restore altered ecosystems as nearly as possible to conditions they would be in today had natural ecological processes not been disturbed.
- Develop an awareness of threats that impact or have the potential to impact Park resources.
- Actively respond, as a land management agency, to these potential threats.

In addition to stating general management objectives, the plan identifies specific objectives for island resources. Management guidelines to meet objectives were also described in the Plan. Black Rats are specifically mentioned in the GMP. The objective stated for Black Rat management is "eradication". The *action* to meet this objective calls for the Park to initiate an eradication program on East Anacapa Island. Under the criteria established by the GMP for rat eradication, such a program must:

- a) Be effective
- b) Be selective for rats
- c) Have the least possible effect on native mouse populations and other forms of plant and animal life

- d) Present the lowest risk to visitors and staff
- e) Be economical and simple to maintain

Alternatives proposed in this analysis meet these criteria to varying degrees.

The Resources Management Plan (RMP) also identifies this project as a necessary action to perpetuate natural processes and resources within the Park. The RMP flows from the General Management Plan (1985) and Statement for Management (1991). The RMP is the Park's strategic plan for the long-range management of its resources and a tactical plan identifying short-term projects.

## *Purpose & Need and Proposed Action*

### *Purpose*

The purpose of the proposed action is to eradicate rats from Anacapa Island and keep it and all Park islands rat-free. Eradicating rats from Anacapa Island would improve seabird-nesting habitat and could aid in the recovery of some species such as the Xantus' Murrelet and Ashy Storm-Petrel.

### *Need for Action*

#### *Introduced Species and the Importance of Island Ecosystems*

It is now widely accepted that current rates of species extinctions are dramatically higher than background rates (Raup 1988), that most current extinctions can be directly attributed to human activity (Diamond 1989), and that for ethical, cultural, aesthetic, and economic reasons, this current rate of extinction is cause for considerable concern (Ehrlich 1988, Ledec and Goodland 1988). The causes of

anthropogenic extinctions can be roughly divided into four broad categories: non-sustainable use of resources, habitat destruction, pollution, and introduction of non-native species.

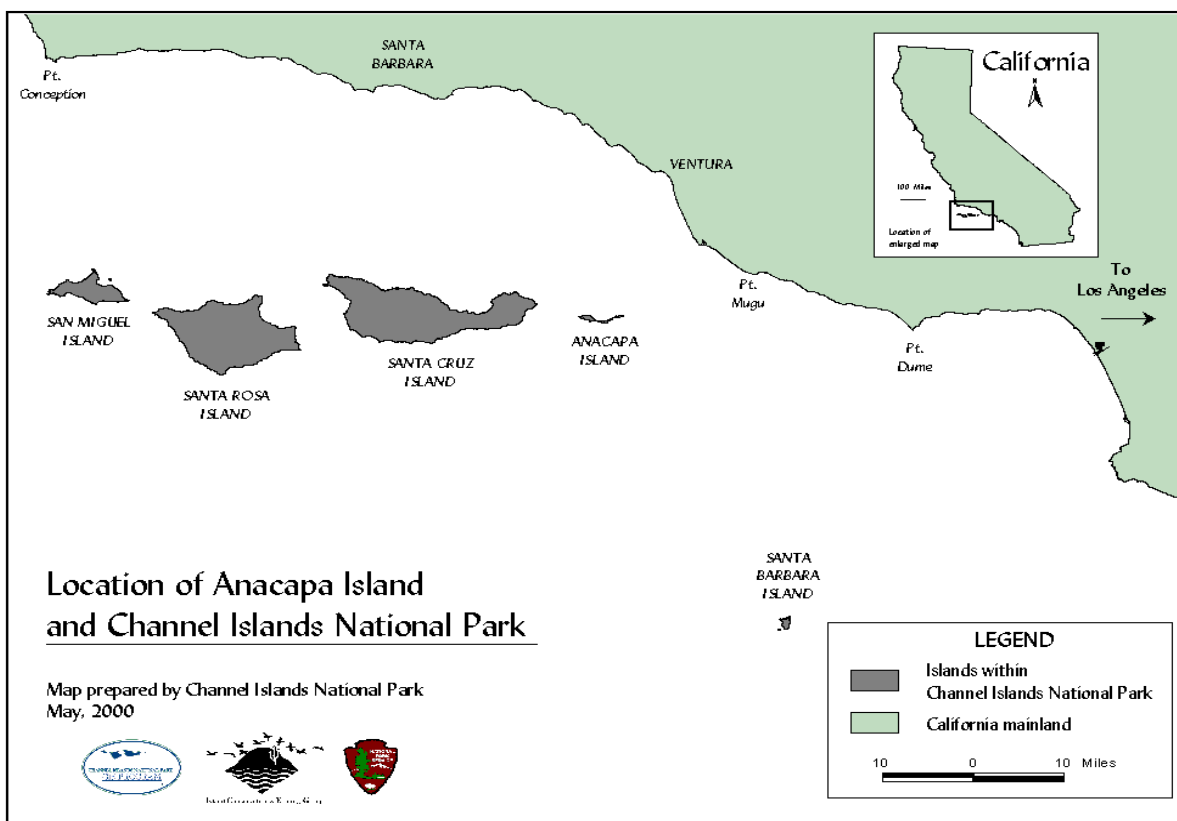
Problems in the first three categories are often acute and can directly affect human welfare on an observable time scale. These qualities have made them the focus of public environmental concern. The introduction of non-native species has received less publicity and professional attention (Coblentz 1990, Soulé 1990); however, introduced species are responsible for 39% of all recorded animal extinctions since 1600 for which a cause could be attributed (World Conservation Monitoring Centre 1992). Thus, some impacts of introduced species are irreversible (reviewed by Groves and Burdon 1986; Mooney and Drake 1986; and Hengeveld 1989) and at least as devastating as the other categories (Atkinson 1985, 1989, Soulé 1990). Once established, introduced species often become permanent in ecological time unless intentionally removed (Tershy and Croll 1994).

Island ecosystems are particularly vulnerable to both extinctions and the impacts of introduced species (Diamond 1985, 1989, Olson 1989). Of the 484 recorded animal extinctions since 1600, 75% have been island endemics (World Conservation Monitoring Centre 1992). Introduced species were completely or partially responsible for 67% these extinctions (based on the 147 island species for which the cause of extinction is known, calculated from World Conservation Monitoring Centre 1992).

Islands are important to the conservation of biodiversity for four reasons:

- 1) A large percentage of their biota are endemic species and subspecies (Darwin 1859, Elton 1958);

Figure 1: Location Map of Anacapa Island.



- 2) They are important breeding areas for seabirds, pinnipeds, and sea turtles, which forage over thousands of square kilometers of ocean but are dependent on relatively small amounts of protected land on islands for breeding and nesting;
- 3) Many islands are sparsely inhabited or uninhabited by humans, keeping socioeconomic costs of protection low;
- 4) the species and ecological communities on islands have evolved in natural fragments, making them less susceptible than continental species to the problems of habitat fragmentation caused by small reserve size.

In summary, by restoring and protecting islands, functioning unmanaged ecosystems can be maintained without large expenditures for land acquisition or significant conflict with local human populations (Tershy and Croll 1994).

## Introduced Commensal Rats

There are three species of rats in the genus *Rattus* which are commensal with humans and which have been introduced to islands throughout the world. In order of decreasing size they are: the Norway or Brown Rat (*R. norvegicus*), the ship or Black Rat (*R. rattus*), and the Pacific or Polynesian Rat (*R. exulans*). They have different dietary preferences, distributions and histories of introduction, but all three species are omnivorous, behaviorally plastic, have high reproductive rates, and can survive in a variety of habitats (Atkinson 1985, Moors et al. 1992). These traits make them ideally suited to survive on a variety of predator free islands. At least one of the three species occurs on an estimated 82% of all island groups, with *R. rattus* being the most common introduced rat (Atkinson 1985).

## ***Impacts of Introduced Rats on Island Ecosystems***

The most obvious impacts of introduced rats on island ecosystems are extinctions of endemic species. Introduced rats (*Rattus* spp) are responsible for an estimated 40 - 60% of all bird and reptile extinctions (ICEG Analysis of World Conservation Monitoring Centre Data, Atkinson 1985). They have caused extinctions of endemic mammals and invertebrates on the Galapagos and elsewhere (Andrews 1909, Brosset 1963, Daniel & Williams 1984, Meads et al. 1984).

Even if extinctions do not occur, rats can have ecosystem wide effects on the distribution and abundance of native species through direct and indirect effects. For example, comparisons of rat-infested and rat-free islands, or pre and post rat eradication experiments, have shown that rats depressed the population size and recruitment of birds (Thibault 1995, Cambell 1991), reptiles (Whitaker 1973, Towns 1991, Cree et al. 1992), plants and terrestrial invertebrates. Rats have also been shown to affect the abundance and age structure of intertidal invertebrates (Navarrete & Castilla 1993).

Each of the three species of commensal *Rattus* have been implicated in extinctions and prey populations changes. Due to their different natural histories, however, each species has slightly different impacts. For example *R. norvegicus* tends to have a greater impact on adult burrow nesting seabirds than does *R. rattus*, but less of an impact on tree nesting birds (Atkinson 1985). Consequently, the introduction of new *Rattus* species should be avoided, even to islands which already have introduced rats (Moors et al. 1992).

## ***Rats on Anacapa Islands***

The three Anacapa islets have been subjected to introduced cats, sheep, rabbits, and rats. All but the rats have been successfully

eradicated. The Black Rat was introduced to the Anacapa Islands prior to 1939 (Sumner & Bond 1939) probably in supplies transported onto the island for sheep ranching or lighthouse construction, or from a ship wreck (Collins 1980). Research on the Anacapa Island by Main et al. (1972), Collins (1979), Erickson & Halvorson (1990), and Howald et al. (1997) demonstrate that Black Rats:

- 1) Are most abundant in the coastal areas and canyons on the islands;
- 2) Breed from April through September;
- 3) Feed on native mammals, reptiles, insects, intertidal invertebrates, birds, and plants.

It is believed that the most significant impact rats have on Anacapa Island is on the breeding populations and breeding success of the colonial nesting seabirds, the Xantus' Murrelet (*Synthliboramphus hypoleucus*) and Ashy Storm-Petrel (*Oceanodroma homochra*). These two species are California Species of Special Concern (<http://www.dfg.ca.gov/endangered/birds.html>) and a federal (USFWS) Species of Concern (<http://www.fws.gov/r9mbmo/reports/specon/tblconts.html>). Species of concern are a "high priority for additional research and conservation actions..." (<http://www.fws.gov/r9mbmo/reports/specon/mgmtrec.html>). The California Channel Islands host large proportions of the world populations of these rare species.

Predatory mammals such as rats and cats have been identified by McChesney and Tershy (1998) as the main cause of long-term decline in Xantus' Murrelet populations. The relatively small size of the adults and crevice nesting behavior makes them susceptible to predation by rats. Introduced rats prey on adults, chicks and eggs of many seabirds. Recent surveys of Anacapa Island have found abundant evidence of rat use of cliffs which coincides with preferred murrelet nesting habitat (G.

McChesney, pers. comm., Erickson and Halvorson 1990). Evidence of recent nesting activity by murrelets was found at only 0.4% of potential nesting sites investigated on Anacapa Island (as compared to a 30% success rate on Santa Barbara Island, and with no introduced rats), and all eggs found showed evidence of mammalian predation (G. McChesney, unpub. data). Murrelets utilizing Anacapa are largely restricted to areas inaccessible to rats, such as sea caves, although abundant nesting habitat is found elsewhere. The removal of rats from Anacapa Island will provide a substantial increase in nesting habitat available to these species in California. Seabird colonial nesting likely has evolved in part from predation pressure (See McChesney and Tershy 1998), and Anacapa Island is only one of two of the California Channel Islands which historically has provided terrestrial predator free breeding habitat to seabirds. The other predator free island, Santa Barbara Island, currently supports a large colony of Xantus' Murrelets. Only small numbers of Xantus' Murrelets breed at the other Channel Islands. The abundance of nesting habitat at Anacapa Island for crevice nesting seabirds such as Xantus' Murrelet and Ashy Storm-Petrel, coupled with Anacapa's similarity to nearby Santa Barbara Island, suggest a potential for Anacapa to support large populations of these species (G. McChesney, pers. comm.). The restoration of Anacapa Island to an introduced predator free status likely will provide substantial benefits to these species. The removal of introduced rats from islands has been identified as a priority to ensure the recovery and long-term viability of Xantus' Murrelet populations (McChesney and Tershy 1998).

## ***Proposed Action***

### ***Anacapa Rat Eradication***

The technique proposed for eradicating rats on Anacapa Island is modeled after other island rat eradication projects that have successfully been completed worldwide. Due to the steep cliffs of the island, an aerial broadcast is necessary to deliver rodenticide to every rat's territory, a condition that has to be met to accomplish eradication. The formation of the islands through uplifting has made the cliffsides of Anacapa Island extremely unstable and dangerous to climb, and thus bait stations cannot be safely placed and maintained on the cliffsides. The cliffsides harbor the greatest density of rats and so for eradication to be accomplished adequate delivery of bait to cliffsides must be ensured. The placement of rodenticide into every rat's territory is critical to the success of the eradication and cliffsides need to be treated. Therefore, broadcast application (aerial and hand broadcast) would be the preferred method. Broadcast of the rodenticide bait would be carried out in all habitats across the island. The rat population size on Anacapa fluctuates between about 750 – 2,000, depending on local conditions. Application of rodenticide would be completed within 1-2 days.

A local certified agricultural pesticide applicator would be used for conducting the application. The applicator would have to meet the following criteria: 1) OAS and California Department of Agriculture certification for aerial application of rodenticide; 2) Helicopters equipped with differential GPS units to ensure even coverage across the island; 3) Experience in aerial activities in remote offshore Channel Islands National Park.

Bait would be broadcast at a maximum rate of 15 kg of 25 ppm bait/ha. A maximum of two applications is anticipated.

The chronology of eradication would begin with baiting in representative habitat within the project area. Representative habitat may include all of East Islet or smaller area on Middle Islet that allows for easy and unobtrusive access. Representative habitat contains prime rat habitat including intertidal areas, and dense vegetation sites. The objective of the initial eradication treatment is to conduct both effectiveness and validation monitoring of the project's objective and the alternative's proposed activities including mandated mitigation. This effort would be followed up with the completion of the island-wide eradication activities.

The window for bait application is November through December (late fall). Baiting may begin as early as 2000. The late fall period offers the optimum time to apply the bait for three reasons:

- 1) The endangered Brown Pelicans are not breeding on the island;
- 2) The rats are in decline due to lack of available food sources, which would cause them to eat the bait more readily.
- 3) The onset of the rainy season would expedite the degradation of any residual bait not consumed by the target species.

The chronology of proposed eradication activities is as follows:

2000 - 2001: During the application window of Nov-Dec, initiate eradication activities in representative habitat within project area.

2001 – 2002: Complete Island-wide eradication during the Nov/Dec application window.

After treatment of East Islet and approximately 20 ha of Middle Islet there may be a need to retreat intermittently Middle Islet to prevent rats from re-invading East Island from Middle Island.

This proposed action would require Federal Environmental Protection Agency (EPA)

approval for use of rodenticide bait on the island. A complete description of the proposed action can be found in Chapter II – Alternatives section.

### ***Emergency Response Plan***

The emergency response plan (ERP) would be implemented under the following conditions:

- 1) When it is suspected that rats may be on Santa Barbara Island.
- 2) After the eradication effort on Anacapa Island has concluded.

The ERP has three main components with a decision process tied to each component. The first component (Detection) focuses on the verification of presence of the rat. This is done by intensive initial field investigation using normal rat detection techniques (chew bait blocks and sticks, trapping (live and snap, visual inspections, tracking tiles).

If rat presence is verified, the second component (Problem Evaluation) is a field investigation decision process that determines the extent of the rat problem, the terrain associated with the rat territory, and the affected resources within colonized area.

The third component (Problem Resolution) evaluates all of the factors (extent, terrain, affected resources) and through a decision process makes a recommendation on the course of action that is necessary to eradicate the rats. The decision process that takes place in all three components is fully described in Chapter II – Alternatives.

### ***Prevention***

All rat introductions to the Channel Islands have been through the assistance of humans.

The most common ways rats are introduced to the islands are:

- 1) Boats moored directly to the island or anchored nearby
- 2) Dinghies or other small boats pulled up on shore
- 3) Carried ashore in cargo such as foodstuffs, and building materials
- 4) Rafting ashore in flotsam
- 5) Shipwrecks
- 6) Planes and helicopters

Non-endemic mice are the most likely species to reach the islands because of their small size and habit of living in facilities and storerooms, and are more likely to escape detection. However, rats may occur more frequently on large fishing vessels and other boats.

To minimize the risk of rodent introductions to the Channel Islands, a set of standards would be implemented by the Park prior to conclusion of eradication activities on Anacapa Island. The minimum proposed standards for the prevention of rodent invasion to the Islands are as follows:

- 1) Rodent proof storage areas.
- 2) Rodent proof containers that haul equipment and supplies to the Islands.
- 3) Control rodents at all departure points, including planes, boats, and helicopters that transport people and materials to the Islands (Park will work with concessionaires to accomplish objectives when departure points are not under the control of the Park).
- 4) Inform and educate all people who visit the islands. This includes visitors, concessionaires, contractors, employees, permittees, and researchers.

## *Scope of the Proposed Action*

This document focuses on three specific actions: 1) The activities that are necessary to eradicate rats from Anacapa Island, and 2) The activities necessary to respond to accidental rat introductions to Anacapa and Santa Barbara Island, and 3) Preventing rodent introductions to all Park Islands.

This EIS does not cover the eradication of rats from any other Park Island where rats have become established, specifically San Miguel Island. Any eradication activity on San Miguel Island would require additional NEPA analysis due to the unique environmental issues associated with the island. Santa Barbara and Anacapa Islands have similar resources and resource issues.

## *Decisions to be Made*

For this EIS, the official responsible for making the decision on which alternative is selected is the National Park Service Regional Director, Pacific West Region. The Regional Director, once the Final EIS has been completed, can decide to:

- Select one of the alternatives analyzed within the Final EIS, including the No-Action alternative; or,
- Modify an alternative (for example, combine parts of different alternatives), as long as the environmental consequences of the modified action have been analyzed within the Final EIS.

Factors the Regional Director will take into consideration in making a decision are:

- Does the alternative meet National Park Service guidelines and policies, including the Channel Islands General Management Plan?



- How well does the alternative meet the “Purpose and Need” for this project?
- How does the alternative respond to and/or resolve the environmental issues raised for this project?
- The nature and extent of public comment to the DEIS.